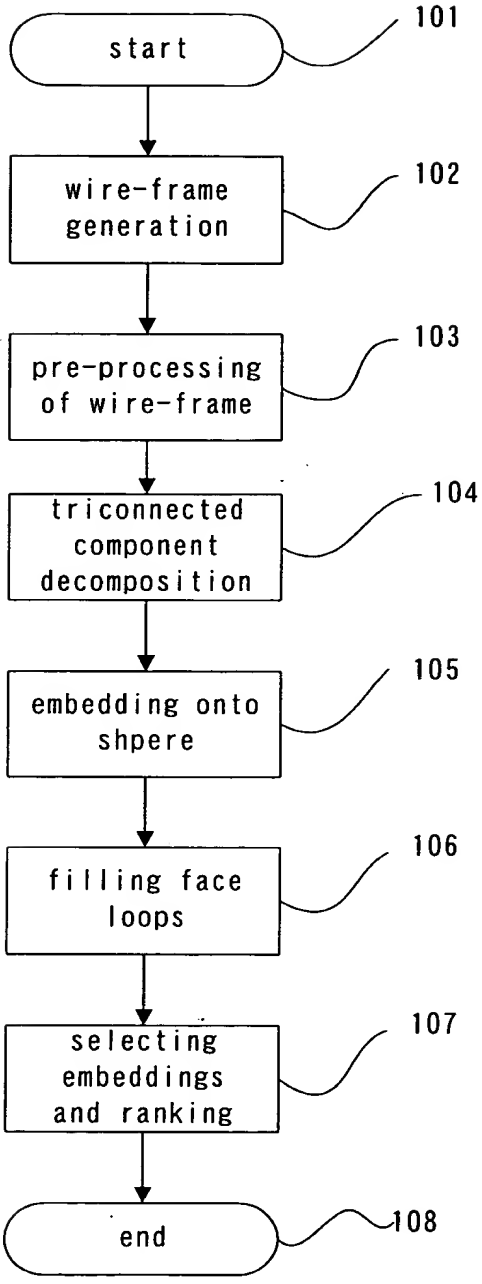
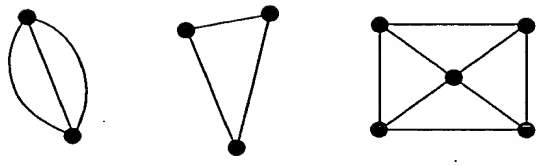
Fig. 1


start
101
wire-frame generation
102
pre-processing of wire-frame
103
triconnected component decomposition
104
embedding onto shpere
105
filling face loops
106
selecting embeddings and ranking
107
end
108

0054030



(a) (b) (c)

(a) 3-bond graph
(b) traiangle graph
(c) triconnected graph

Fig. 2

09648156 - 082500

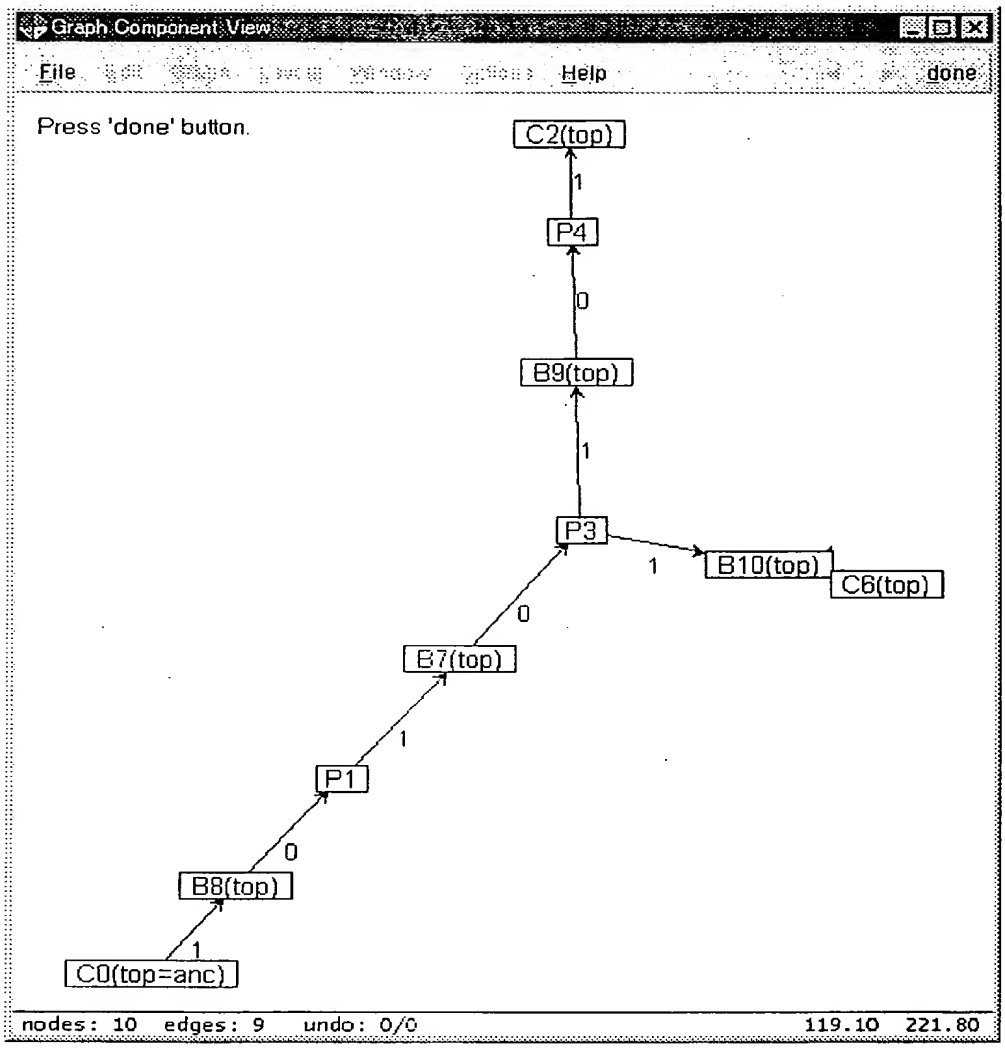
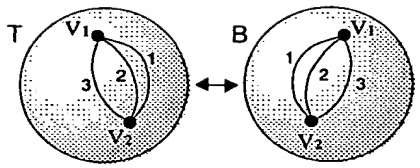
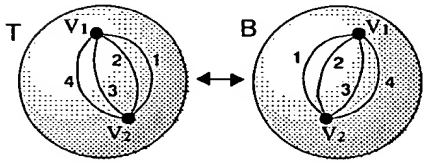
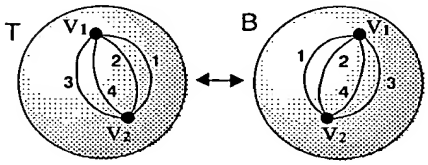


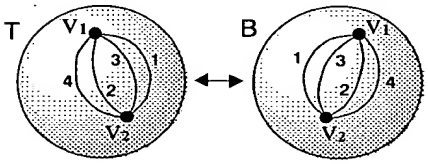
Fig. 3



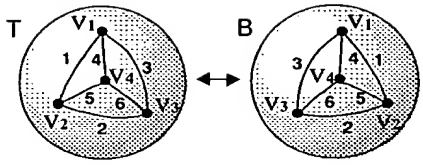
3-bond



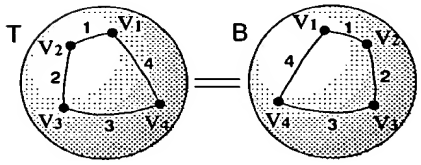




4-bond



Triconnected graph



Polygon graph

Fig. 4

0050950-5218450

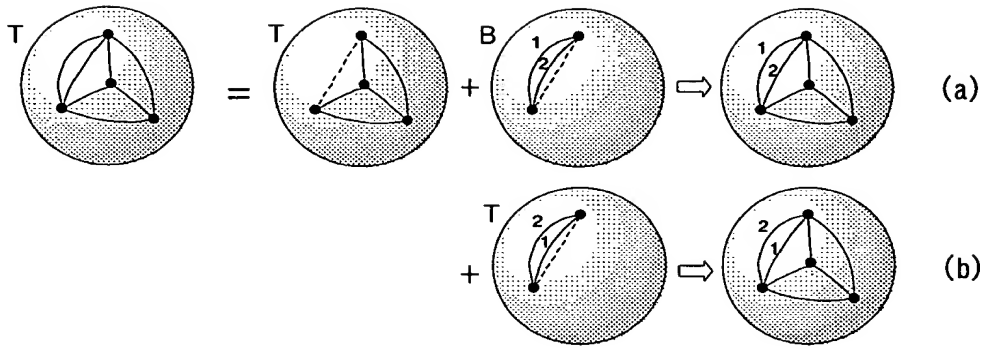
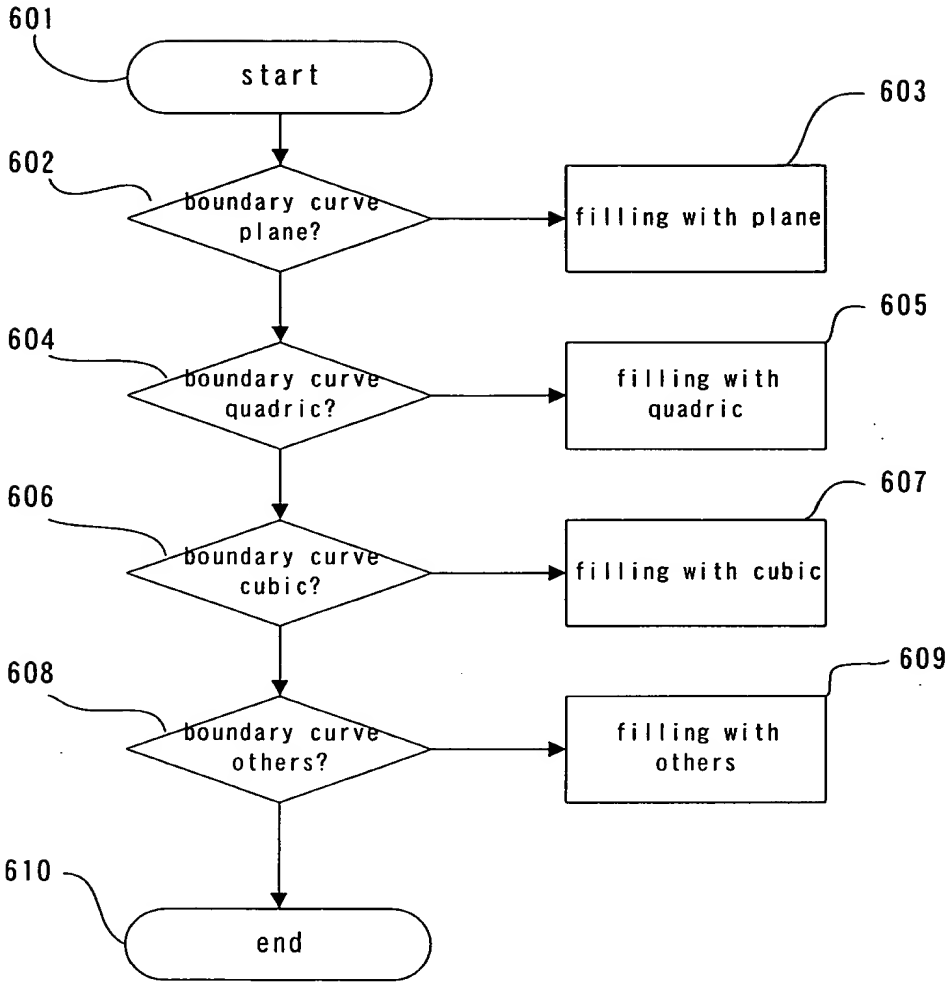


Fig. 5

Fig. 6



0964136-080500

0064525-062500

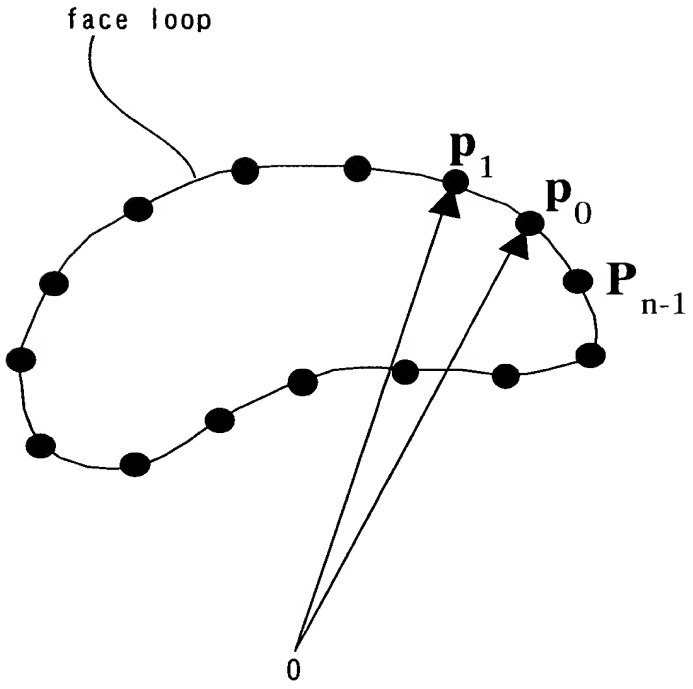


Fig. 7

0054890 - 08/05/00

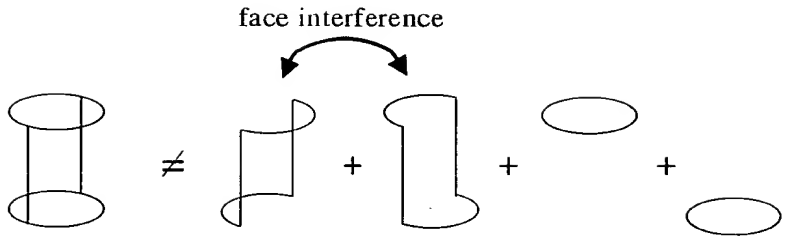


Fig. 8

0050480-0050500

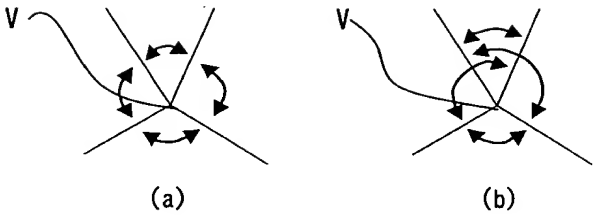


Fig. 9

```
Queue = empty;
forall (embeddings) {
        Score = 0;
        forall (loops) {
                Evaluate the loop;
                If (acceptable)    Accumulate the evaluated value to Score;
                else               goto next_embed;
        }
        forall (vertices) {
                Evaluate the combination of loops around v;
                If (acceptable)    Accumulate the evaluated value to Score;
                else               goto next_embed;
        }
        forall (edges) {
                Evaluate a pair of loops;
                If (acceptable)    Accumulate the evaluated value to Score;
                else               goto next_embed;
        }
        Register in Queue the pair of the embedding and computed Score;
    next_embed:
}
If (Queue is not empty) {
        Sort the Queue based on Scores;
}
```

Fig. 10

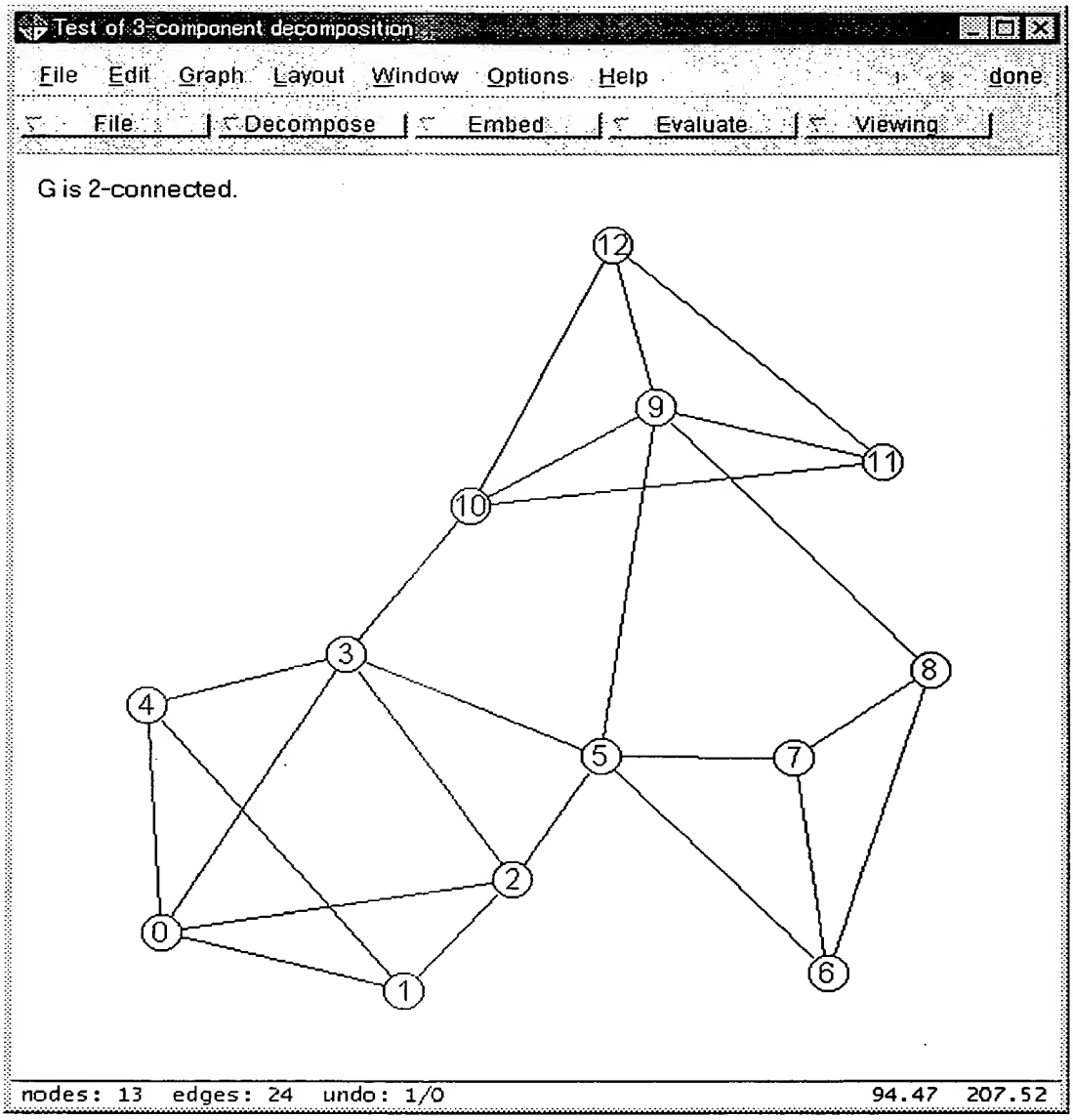

Test of 3-component decomposition
File Edit Graph Layout Window Options Help done
File Decompose Embed Evaluate Viewing
G is 2-connected.
12
9
11
10
3
8
4
5
7
2
0
6
1
nodes: 13 edges: 24 undo: 1/0
94.47 207.52

Fig. 11

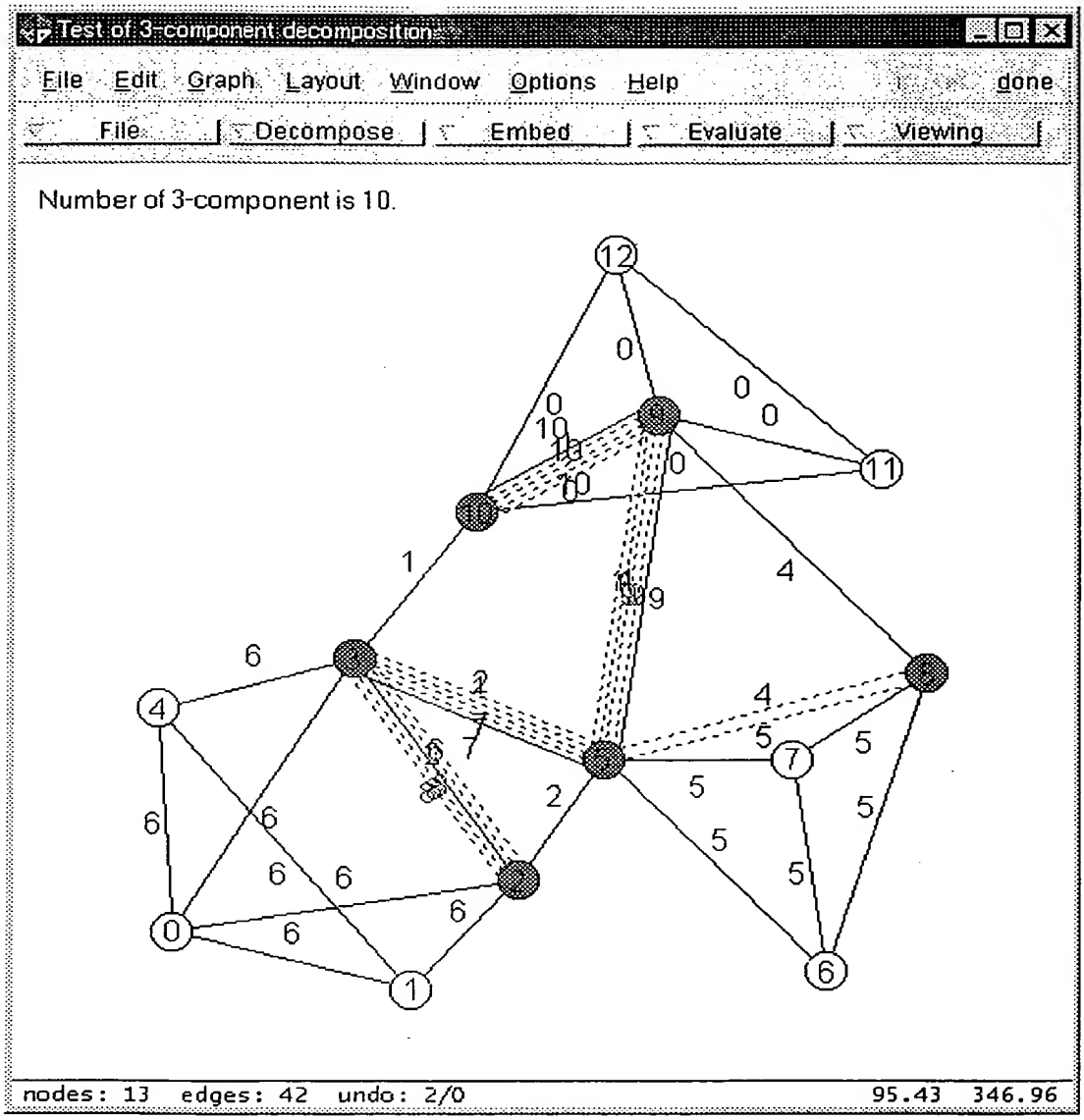

Test of 3-component decomposition
File Edit Graph Layout Window Options Help done
File Decompose Embed Evaluate Viewing
Number of 3-component is 10.
nodes: 13 edges: 42 undo: 2/0
95.43 346.96

Fig. 12

09648139 - 082500

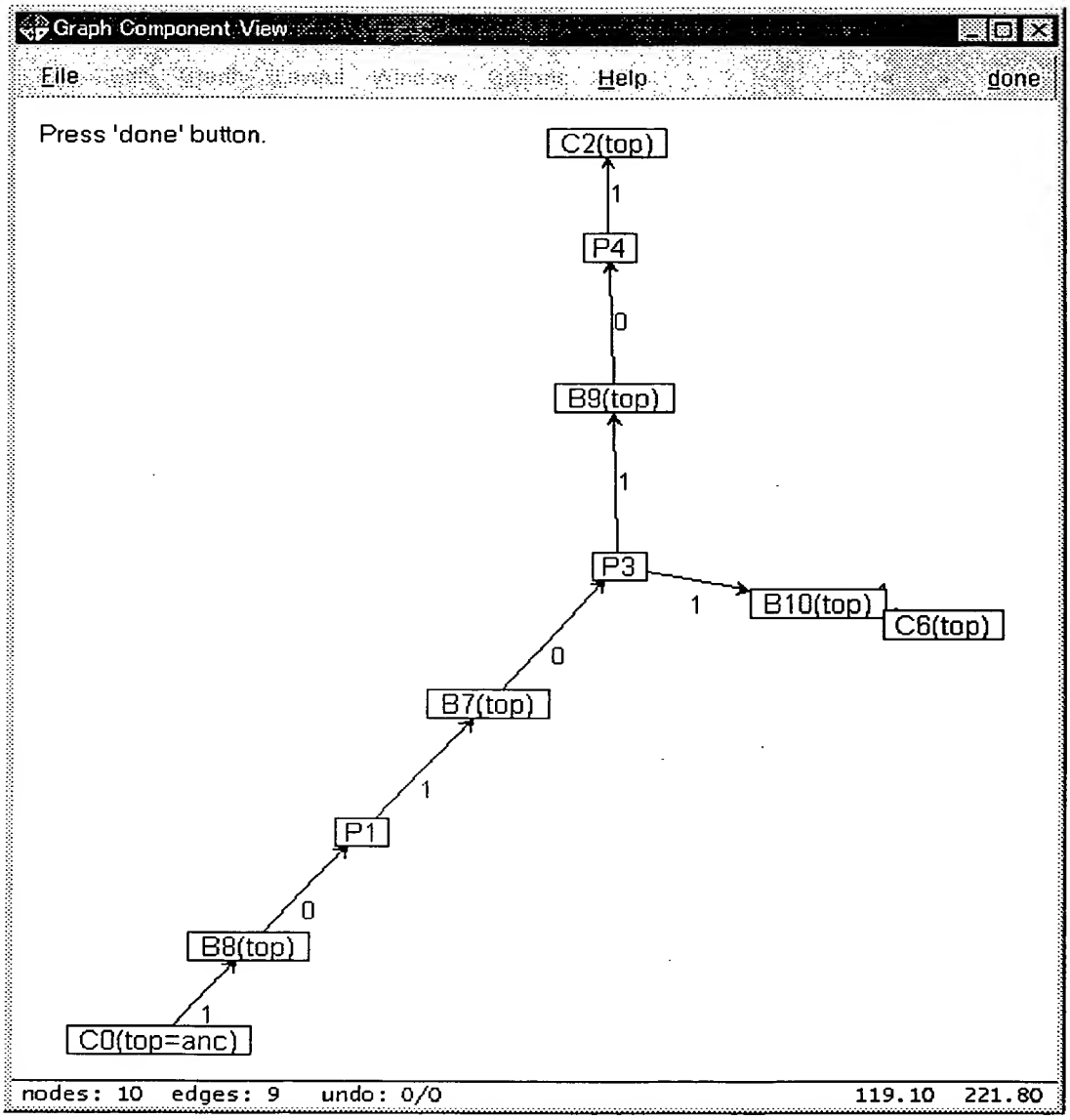


Fig. 13

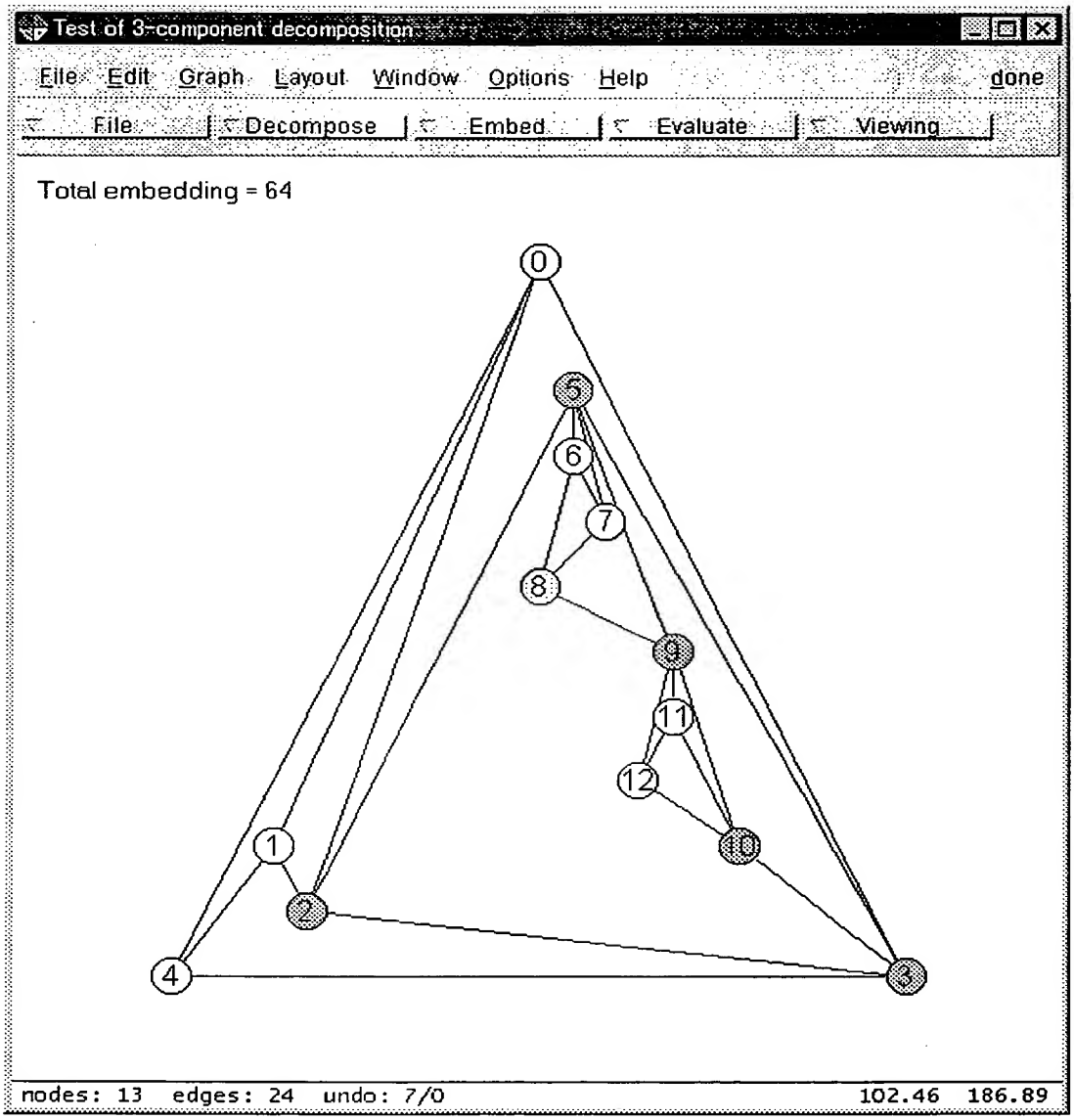


Fig. 14

0960436.082500

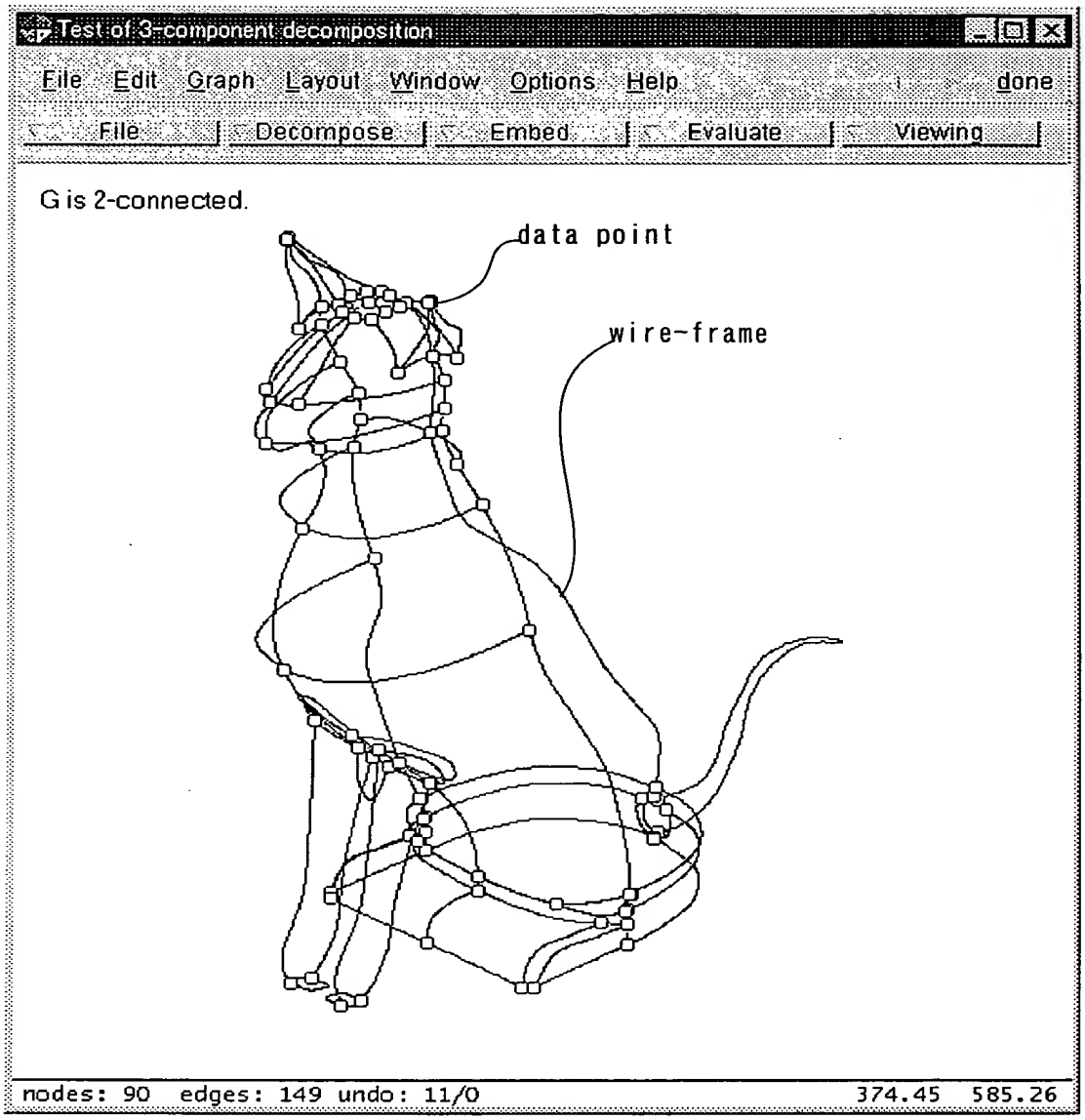

Test of 3-component decomposition
File Edit Graph Layout Window Options Help
done
File
Decompose
Embed
Evaluate
Viewing
G is 2-connected.
data point
wire-frame
nodes: 90 edges: 149 undo: 11/0
374.45 585.26

Fig. 15

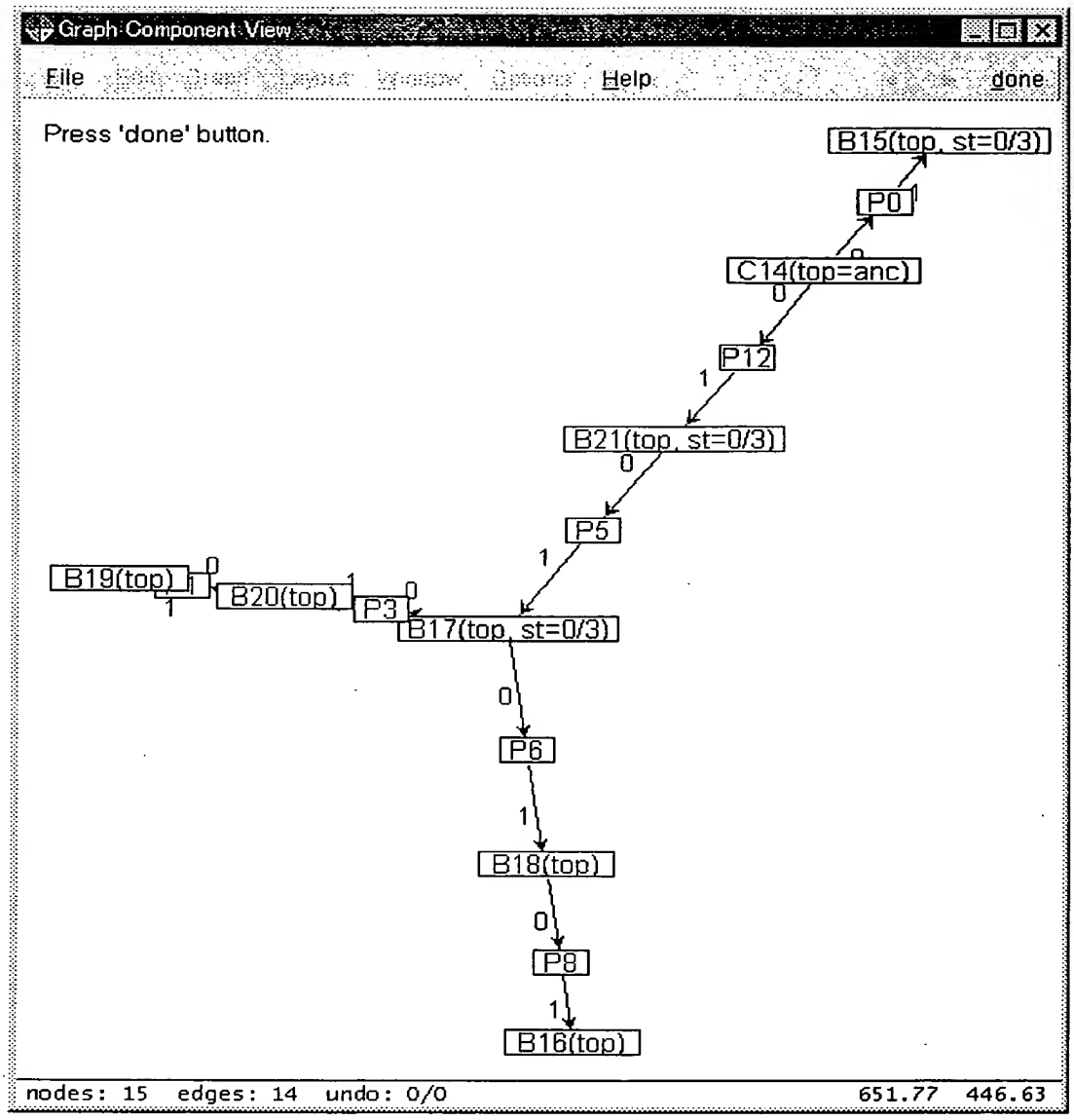

Graph Component View
File
Help
done
Press 'done' button.
B15(top, st=0/3)
P0
C14(top=anc)
P12
B21(top, st=0/3)
P5
B19(top)
B20(top)
P3
B17(top, st=0/3)
P6
B18(top)
P8
B16(top)
nodes: 15 edges: 14 undo: 0/0
651.77 446.63

Fig. 16

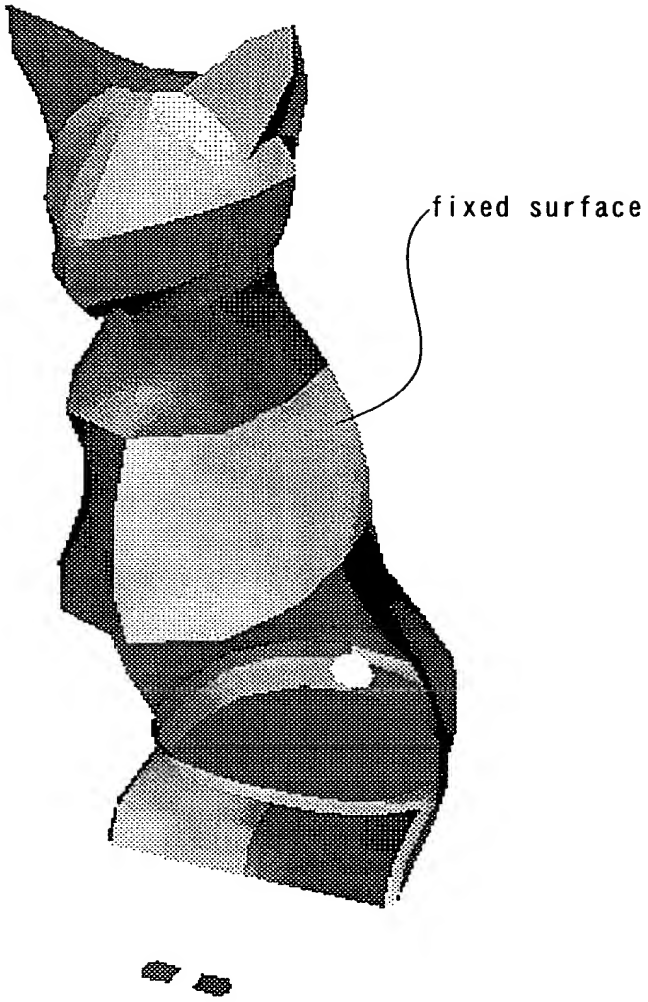


Fig. 17

0052380 "65784960

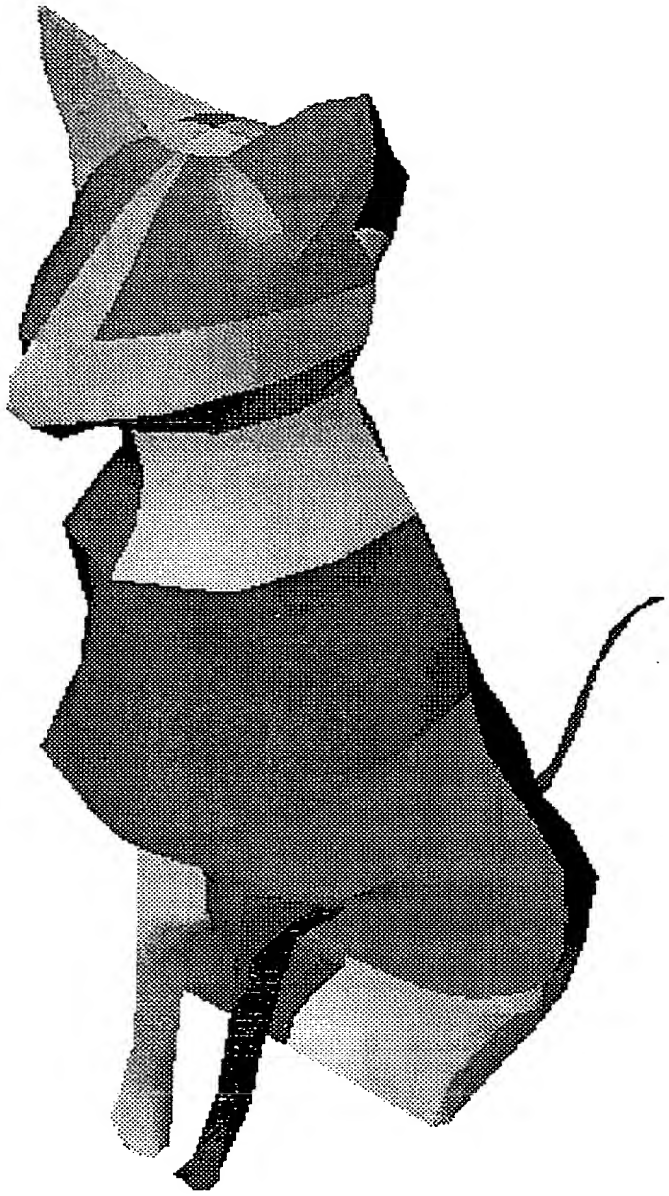


Fig. 18

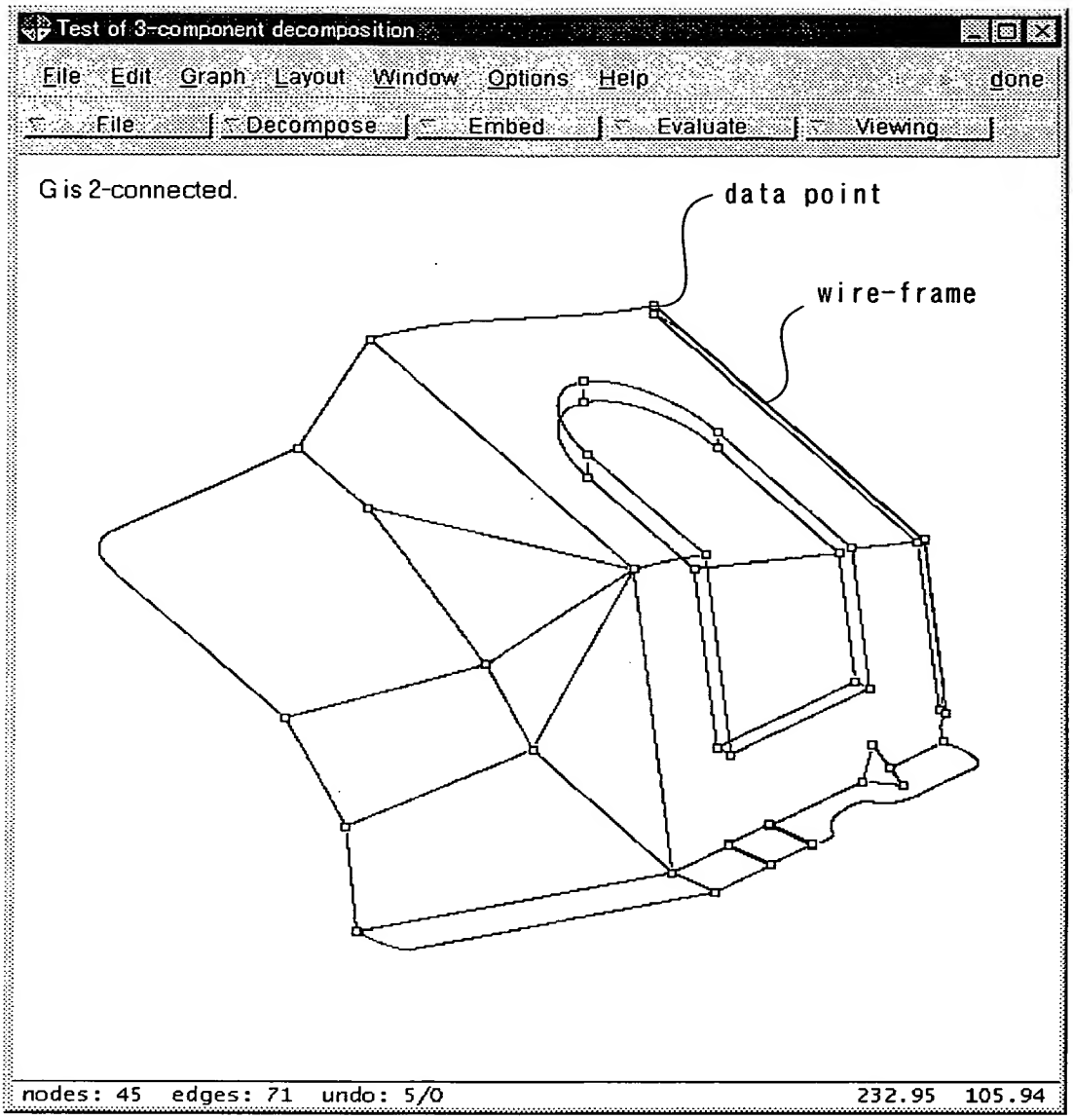

Test of 3-component decomposition
File Edit Graph Layout Window Options Help
done
File
Decompose
Embed
Evaluate
Viewing
G is 2-connected.
data point
wire-frame
nodes: 45 edges: 71 undo: 5/0
232.95 105.94

Fig. 19

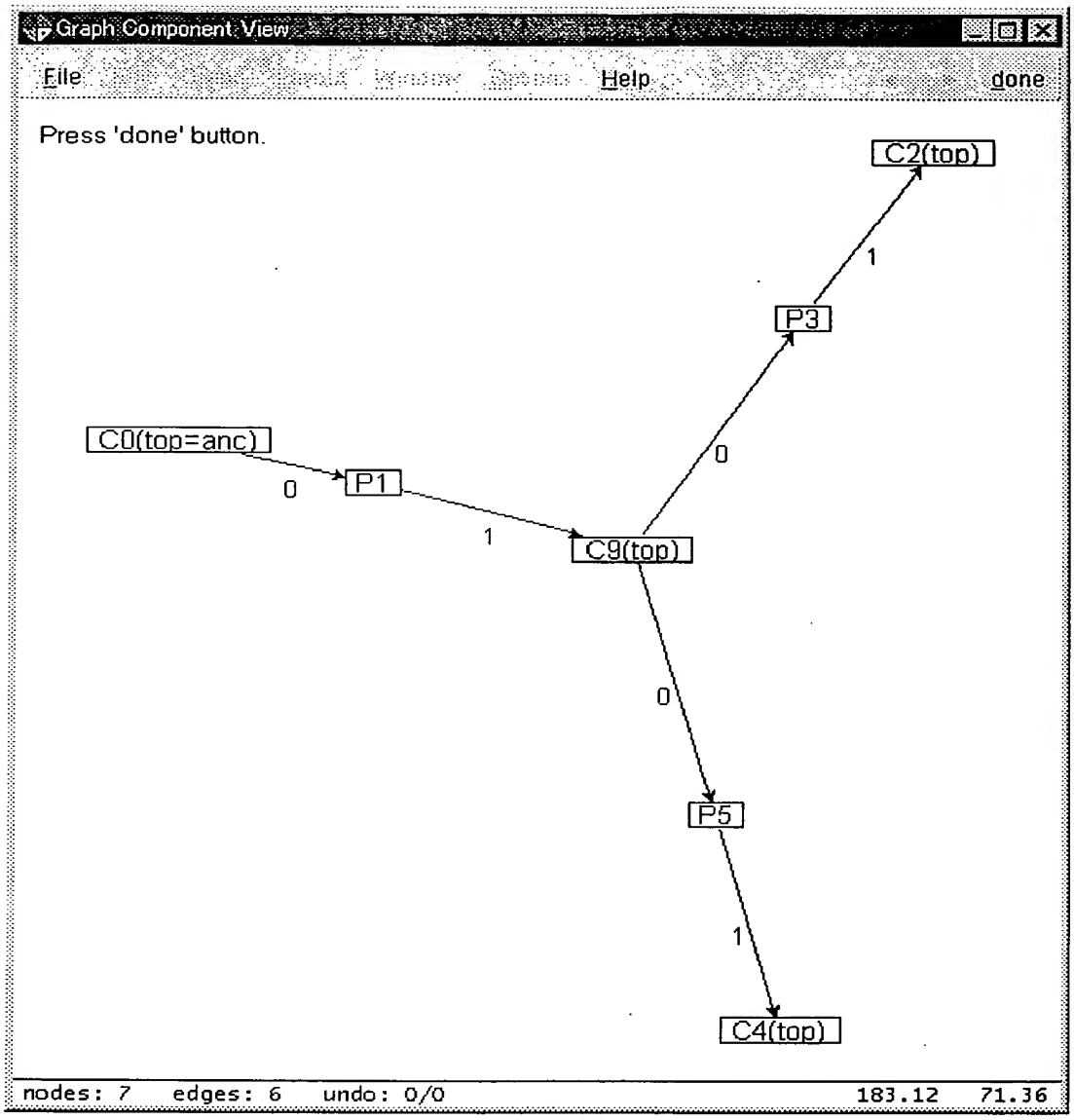

Graph Component View
File
Help
done
Press 'done' button.
C2(top)
1
P3
C0(top=anc)
0
P1
1
C9(top)
0
0
P5
1
C4(top)
nodes: 7 edges: 6 undo: 0/0
183.12 71.36

Fig. 20

0095128 - 0095128

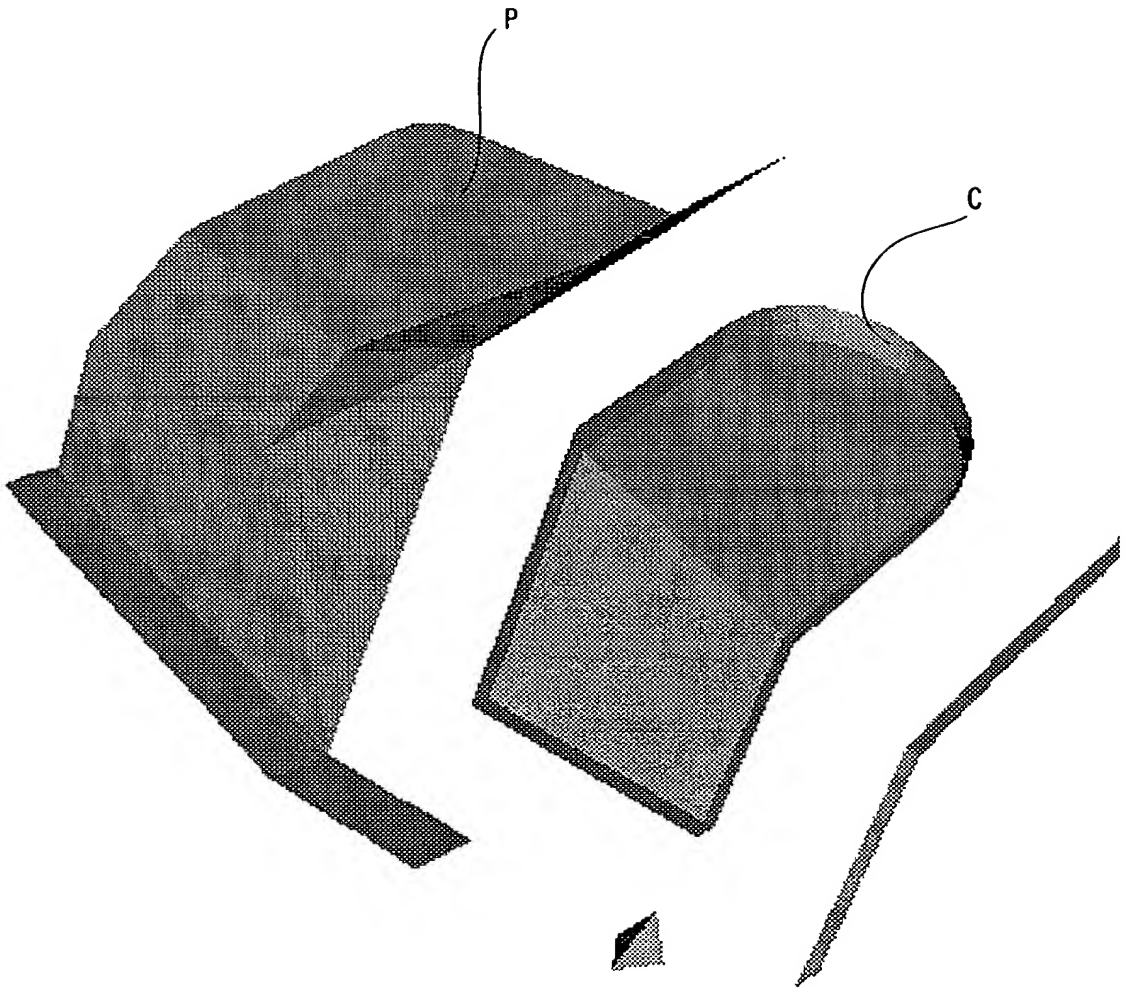


Fig. 21

D0648150 - 092500

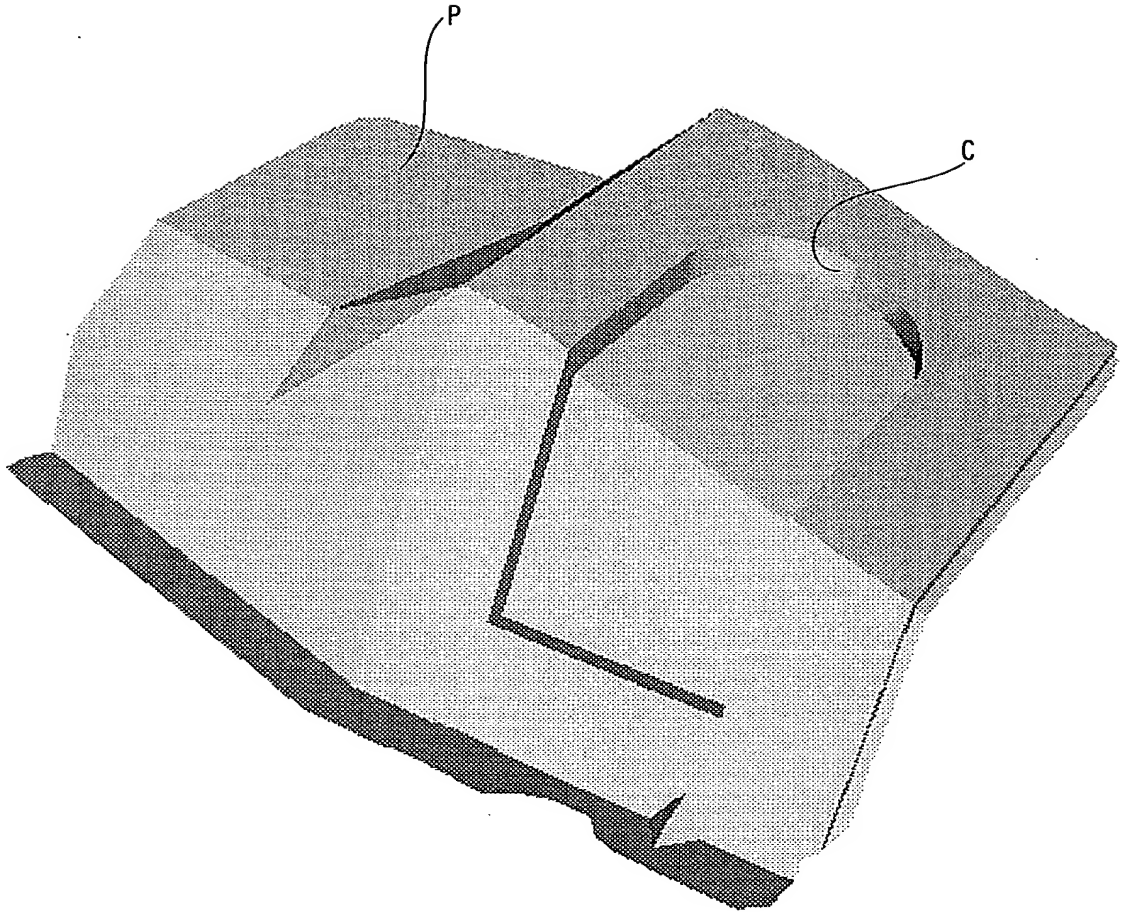


Fig. 22